

# ULTRACONDUCTIVE 4011 COATING

## CONDUCTIVE COATING FOR LIGHTNING STRIKE PROTECTION

Technical Data Sheet

### Approvals and conformities

AIRBUS HELICOPTERS

ECS 7034

The UltraConductive™ coating is a two-component epoxy coating designed as a single-layer spray coating for zone 1A and 2A lightning strike protection and surfacing of composite parts. The coating is stored as a two-part system (base component 4011 and curative component 4010). The coating is designed for direct spray application to the tool/mold surface that has been prepared with release agent.

### Features & Benefits

- **Weight Savings:** at 140 g/m<sup>2</sup>, the coating offers a 35-55% direct weight savings over traditional copper mesh lightning strike protection.
- **Process Compatible:** suitable for process automation and simplifies traditional lightning strike protection repair methods.
- **Convenient:** reduces material and labor costs by requiring fewer surface materials; compatible with existing primers and topcoats.
- **Improves Safety:** eliminates unnecessary layers of dielectric materials used above conventional lightning strike protection to correct surface imperfections.

## ***DIRECTIONS FOR USE***

### Surface Preparation

Coat tool/mold surfaces with an appropriate release agent. If required, mask off desired sections.

### Mixing

Prior to combining the 4011 and 4010 components, thoroughly agitate each component independently for 10 minutes using a paint shaker or propeller mixer. Ensure both components are fully mixed with no sediment at the bottom of each container.

No thinners are required. If dilution is needed to reduce the viscosity, the use of methyl ethyl ketone (MEK) is recommended.

Combine the 4011 resin component with the 4010 curative component at a mix ratio of 6.3 grams resin to 1.0 gram curative by weight. Thoroughly mix the components together on a paint shaker for at least 5 minutes. The working life of the combined system is two hours at 25°C (77°F).

### Application

Apply the coating using HVLP spray equipment. If needed, strain the coating system into an HVLP

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spray gun using a 100-mesh filter. Set the air pressure to 30 psi (2 bar).

Spray the coating directly on to the desired surface from 10-12 inches (20-25 cm) away in alternating spray patterns with a 50% overlap. Allow the coating to flash off for 2 minutes between each coat. Apply the coating in a paint booth with adequate exhaust capability.

The wet film thickness needed to achieve a specific dry film thickness is somewhat dependent on ambient temperature and air humidity. Under most conditions, spray to a wet film thickness of 90-100 microns to achieve a cured areal weight of 0.029 lb/ft<sup>2</sup> (140 g/m<sup>2</sup>). It is recommended to spray 2-3 witness coupons of varying areal weight to allow a more exact determination of the wet areal weight that gives the desired cured areal weight.

The UltraConductive 4011 coating must be applied with a wet appearance. The solvent should be seen flashing off within moments after spraying. If no solvent is seen flashing off, the coating has been sprayed too dry; this will adversely affect the electrical conductivity. A dry-sprayed coating will have small spheres of material present on the coating. To correct, reduce airflow, increase coating flow, and/or spray closer to the part.

### Curing

Pre-bake the coated tool to remove all tack and solvents from the coating. Pre-bake in a preheated oven at 100°C (212°F) for 30-40 minutes. Optimally, the tool should reach 95°C (203°F) for 15 minutes. Pre-bake times may vary depending on tool thickness. Allow tool to cool before applying composite prepreg.

Following pre-bake, coated tools may be processed through standard composite layup procedures, including composite prepreg application, prepreg repositioning, vacuum bagging, autoclave, or out-of-autoclave cure, composite part release, and trimming.

Prepreg fabric or tape may be placed directly on to the pre-baked UltraConductive coating. If needed, the prepreg can be gently removed and repositioned without damaging the UltraConductive coating.

The coating cures during the composite cure cycle. Follow the manufacturer's cure schedule for the specific composite material. The UltraConductive coating must cure for a minimum of two hours at 121°C (250°F).

Lightly scuff (240-grit) and clean the surface thoroughly prior to paint application to remove residual release agent.

### Typical Cured Properties\*

Sheet resistance depends on coating thickness. At the recommended cured areal weight of 0.029 lb/ft<sup>2</sup> (140 g/m<sup>2</sup>), the sheet resistance is less than or equal to 12.5 mohms/square.

## TECHNICAL CHARACTERISTICS

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### Typical Properties\*

	4011 Resin	4010 Curative	Mixed
Appearance	Silver Liquid	Yellow Liquid	Silver liquid
Density, g/cm <sup>3</sup> (lb/gal)	1.35 (11.3)	0.99 (8.3)	1.27-1.32 (10.6-11.0)

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Volatile Organic Content (VOC), g/L (lb/gal)	669 (5.6)	519 (4.3)	-
Sheet Resistance (mohm/square)	-	-	≤ 12.5
Working Life, days @ -12°C (10°F)	-	-	90

\*Data is typical and is not to be used for specification purposes.

## **PRECAUTIONS FOR USE AND STORAGE**

Each component is shipped separately in a moisture-proof container. The shelf life of each component is one year from the date of manufacture when stored at 4 to 30°C (40 to 86°F) or below in original, unopened containers.

The shelf life of the combined coating system is 90 days when stored at -12°C (10°F) or below in a moisture-proof container.

The working life of the combined 4011/4010 system is two hours at 25°C (77°F).

Before using this or any SOCOMORE product, refer to the Safety Data Sheet (SDS) and label for safe use and handling instructions.

For industrial/commercial use only. Must be applied by trained personnel only. Not to be used in household applications. Not for consumer use.

**UltraConductive™ is exclusively distributed, marketed, and manufactured by SOCOMORE.**

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**This technical data sheet replaces and cancels the previous one.**

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